

Attachment A

THE MANUFACTURING DIVISION  
HOME NETWORKS, INC.TO: Joe Smallwood  
cc: K. Ohashi WITNESSED and UNDERSTOOD

page 1 of 7

FROM: P. Thomsen  
DATE: [REDACTED]

P. Thomsen

SUBJECT: CAPTION SURFER PATENT PROPOSAL [REDACTED] AMENDMENT

Joe,

Following your receipt of the original [REDACTED] patent proposal for this concept, we discussed it with HAL-Legal, David Cunningham. At your and his request attached is an amendment to that [REDACTED] proposal with further, deeper details regarding the features and functions of Caption Surfer. I did not specifically copy David on this cover memo as I thought you would want to review first and then forward via your office to David's attention. Included as a separate pdf file is a copy of the [REDACTED] proposal with two witnessed and understood signatures.

In addition to the deeper detail discussion, I have also amended some of the itemized elements on our internal patent application form. Those itemized amendments immediately follow this cover page as page 2~7 + slides 8~22 in file CS\_EXAM.ppt.

Microsoft's TV PAK web access is a member only site requiring a login ID and password. When I emailed to Microsoft and asked how to become a member they responded with an email advising that since I'm with Hitachi (based on my email address and information I supplied to them (work address, phone, etc.) I would be allowed access to their site. Microsoft's email included the ID and password so I was able to obtain the attached exhibit (it's why I never asked you to approve an NDA with Microsoft for this subject!). I have no idea how to handle such confidential documents in a patent disclosure application so I leave that to your and David's expertise.

Final point is a group of color Powerpoint slide printouts attached showing one example of how this concept would work from the customer's perspective. I also have the electronic Powerpoint presentation (including animations) and have supplied to you via email.

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## AMENDMENT TO CAPTION SURFER.doc

Page 2

**4. Please explain background circumstances.....****5. Please explain the objects, features.....**

Original proposal did not detail sufficiently the "object" ( purpose and operation ) of the invention. Further details are included as noted below.

OBJECT: please see page 4

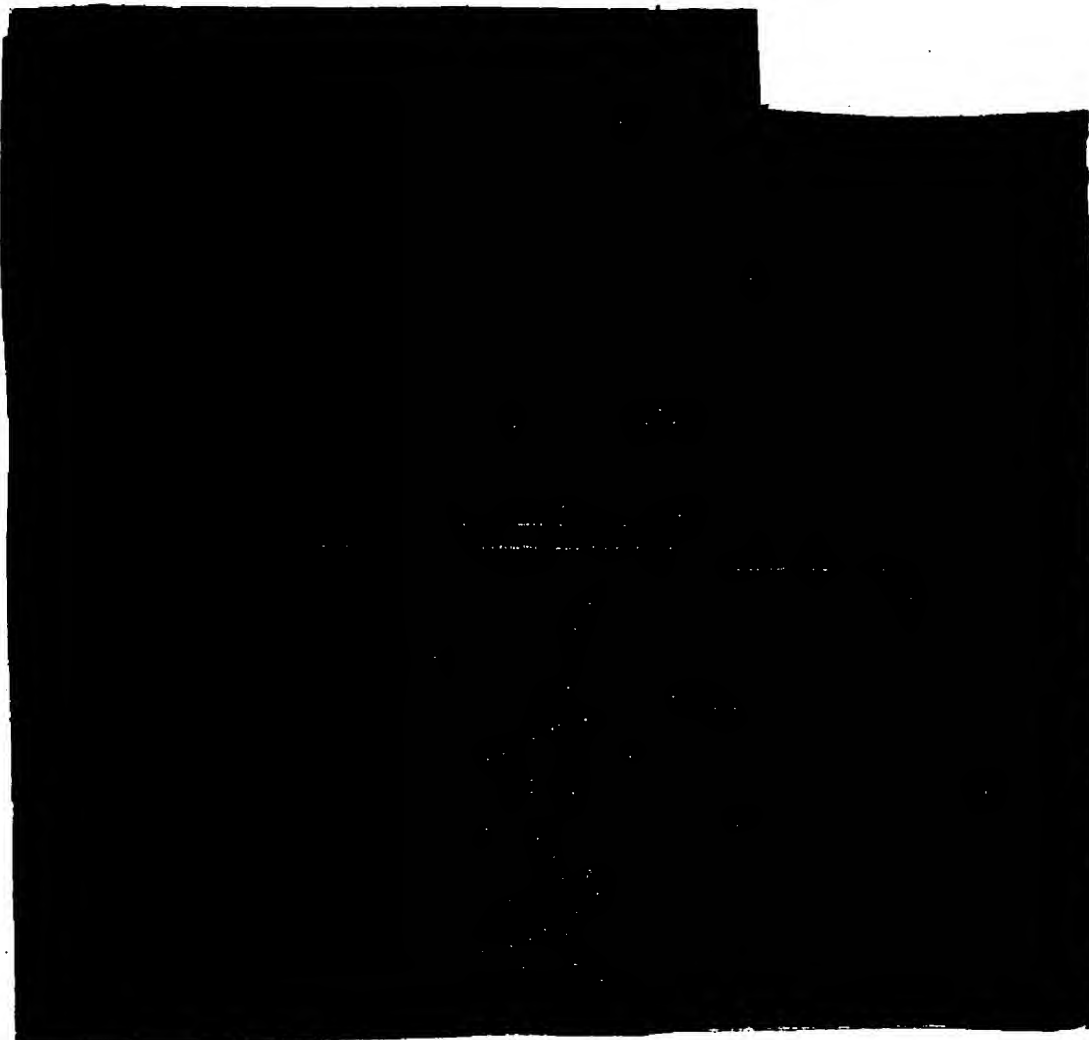
TECHNICAL DESCRIPTION: please see pages 5 ~ 7

**6. DESCRIPTION OF "BEST" MODE**

PLEASE SEE SLIDES pgs 8 ~ 22 and ELECTRONIC EXAMPLE CS\_EXAM.ppt

AMENDMENT TO CAPTION SURFER.doc

Page 3



## AMENDMENT TO CAPTION SURFER.doc

Page 4

**OBJECT of INVENTION:**

Purpose of invention is to allow TV viewer to locate information using keywords selected from U.S. closed caption data services commonly in use by today's television, movie studio ( VCR & DVD rentals ) or virtually any other data source supplying EIA-608 compliant VBI data streams to a video display equipped with a closed caption decoder and this invention.

The viewer can pick a word ( or words ) from the TV's on-screen closed caption display accompanying many television, VCR, DVD, satellite, cable or other program sources. The selection of the word(s) on the TV screen is accomplished using a "cursor" style or thumbstick or joystick type remote control.

Once the word(s) has/have been selected, the invention then "finds" those words in the TV's closed caption display memory; converts them to a format suitable for input to any one of many Internet browsers ( or other data locating means ). The browser ( or other data locating means ) returns with data ( from the Internet or other data source ) that most closely match the keyword search terms "selected" by the customer from the closed caption on-screen display.

The "information" ( as an easy to understand example ) could be from the Internet but this invention does not restrict itself to just the Internet. The information source being accessed by this invention could also be local ( built-in to the TV ) or a corporate, or library-based source of information.

The attached Powerpoint slides depict one example of this invention's purpose to locate information relevant to the video program being watched. These slides represent only one example and do not mean to limit the scope of the intended invention. Accompanying this paper description is a separate electronic file CS\_EXAM.ppt of the Powerpoint slide presentation including animations showing this "typical" operation.

Some other applications would include searching a "warehouse" of video or other material with closed caption data in order to find warehouse material matching the keyword or "search term(s)" submitted by the user. In this materially different application of the invention, the user would supply the search term or keyword(s) by keyboard input and then the invention would search each program's closed caption data for word(s) matching the user supplied keyword(s).

The Powerpoint example shows an Internet browser ( Microsoft's IE 5 ) used as the "search engine" but that is only one of many ways to implement a search function of remote or local data sources or "warehouses". The selected word(s) from the closed caption data stream could be converted to support many different types of "search means" with appropriate interface. A further example of a DVD-ROM (or RAM) "jukebox" containing of several ( or a hundred ) DVD-ROM discs able to be brought "on-line" by mechanical or electronic means. If these DVDs contain closed caption data encoded in compliance with EIA-608, this invention can search and catalog them.

## AMENDMENT TO CAPTION SURFER.doc

Page 5

**TECHNICAL DESCRIPTION OF INVENTION:**

This invention is built upon existing hardware and software common in today's television receivers called CLOSED CAPTION DECODING. There is a standard developed by the EIA and authorized by the FCC for this data service using line 21 of a television signal's vertical blanking interval (VBI). The applicable standard is EIA-608A ( currently being revised to B ). The applicable FCC authorization is provided in the Code of Federal Regulations (CFR 47.119) governing implementation of EIA-608 in U.S. TV receivers and U.S. program caption encoding by content providers.

Anyone can tune to most any TV program today and encounter closed captions by enabling that feature on the TV ( the feature is mandated by the CFRs in U.S. TVs of 13" and larger since 1993 ). It can be observed by watching such a TV and program, that there already exists a means for encoding program captions. The standards ( EIA and CFRs ) noted above also provide for a minimum level of support with respect to character sets, colors and control codes to effect the on-screen location and appearance of the closed captions. The standards also stipulate the method of encoding these characters and control codes in a manner consistent from channel to channel ( among TV stations ) and among content providers. This consistency guarantees the uniform transmission and reception/decoding of captioned programs throughout the U.S.

To support the standard, many semiconductor manufacturers have / are producing microcontrollers ( micons ) with the hardware and software to implement the decoding and display of closed captions in a TV receiver. These same micons also typically handle the infra-red (IR) commands issued by a viewer's hand held remote control. Many remote controls today use a "cursor" or joystick style of moving about on the TV's screen in order to allow the user (viewer) to turn on or off or otherwise adjust features built-in to the TV ( such as opening an on-screen menu to enable closed caption display ).

This invention adds additional software to the TV's micon allowing it to provide the essential functions of the invention, namely:

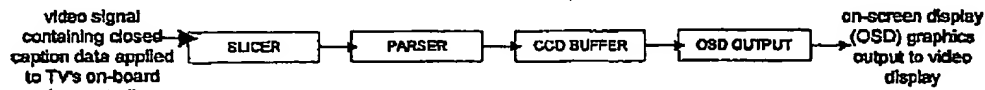
- enable the display of closed captions when instructed by the user
- "freeze" the scrolling of on-screen captions when instructed by the user
- present on-screen to the user a "cursor" or other means allowing the user to "point" to a word or words within the frozen closed caption display area on-screen
- relate the on-screen selected word(s) to closed caption data stored in the micon's closed caption buffer memory
- identify from that relation the specific word(s) in the closed caption buffer
- copy the selected buffer memory locations to another new buffer
- strip away the control codes before/after the new buffer's contents
- output the new buffer's processed data to an appropriate interface
- manipulate the interface's controls means to cause a search of that interface's connected data sources for content containing/matching the new buffer's content
- display the result of the interface's search results in list or table form

## AMENDMENT TO CAPTION SURFER.doc

Page 6

**TECHNICAL DESCRIPTION OF INVENTION: (con't)**

In block diagram form below is a "typical" implementation today of the U.S. standard for closed caption decoding with a brief description next to each block.



- o VIDEO SIGNAL contains captions encoded per EIA-608
- o "SLICER" is micon hardware and software that locates line 21 in the video signal and removes or "slices" the data from that line. Sliced data is put in micon's RAM
- o "PARSER" examines the data sliced from line 21 to determine if it is valid caption data (transmitted on line 21 in packets called CC1 or CC2 or T1 or T2)
- o If sliced data is valid caption or text data it is placed into micon RAM called the "CCD BUFFER"
  - (there are OTHER types of data provided via line 21 such as "VCHIP" data which is NOT displayed on-screen to the viewer and NOT considered in this invention)
- o "OSD OUTPUT" is hardware and software in the micon that is preprogrammed to understand the control codes embedded in the caption data stream and position the caption data accordingly on the TV's screen (in a manner similar to the on-screen TV menu system)
- EIA-608 contains many control codes providing a rich set of options for presenting caption data on-screen such as:
  - o Positioning the black background caption "window" on-screen
  - o POP ON or PAINT ON "window" styles
  - o Number of rows to present and scroll attributes of the caption window
  - o Special characters to denote that music is being played as well as other special characters

To implement this invention's essential function it needs to control the hardware and software mentioned above to:

- cause the caption feature to be enabled (if it is not already enabled)
- "freeze" the contents of an on-screen caption window when the viewer sees a word they would like to select
  - (this prevents subsequent caption data and control codes from overwriting or erasing the on-screen display as well as the contents of the CCD BUFFER)
- activate the TV's on-screen cursor "pointer" (or generate one if not provided)
- move the on-screen 'pointer' in response to viewer's commands as indicated by keystrokes on the TV's remote control
- provide a means (a specific remote control key stroke) to signal the invention that the viewer has positioned the pointer over a word of interest
- review the CCD BUFFER's contents and examine control codes and character data to determine based on screen pointer location which word in the buffer corresponds to the word "pointed to" by viewer

## AMENDMENT TO CAPTION SURFER.doc

Page 7

- copy that word to a new "working" buffer ( RAM ) in order to strip away any remaining control codes ( and in the event the viewer points to a special character such as the clef symbol for music ) advise the viewer accordingly via the TV's on-screen menu system that a search for xxxxxxx ( the selected word ) will be made ( or that a selection error has been made )
- output the working buffer's processed data to one of many "interfaces" to be coupled to an appropriate means for searching the connected database or "warehouse" ( Internet search or other source material ).  
( in this invention "interface" could mean to provide the selected word as data to a PC or other device via USB, IEEE1394, RS-232, I2C, wireless, cellular, EtherNet, HomePNA, etc., etc.)
- display the interface's returning result as a list or table for the user's review and possible further action  
( in the included Powerpoint example slides the "interface" is an Internet capable browser built-in to the TV but this is not the only "interface" possible in order to satisfy the intent of this invention; it is one of the simplest to understand. It is possible via additional software and or hardware to construct a means of interface, result display and further action using the TV's own built-in menu system or another device's interface with appropriate application software and/or hardware to provide the result and further action functions ).

From the above description it is obvious that this invention builds upon existing hardware and software within current television receivers today. By adding only software most TV's today would be able to provide this inventions functions except for the search interface and result interface functions ( since most TVs today do NOT have Internet browsers built-in ).

While TV hardware and software is very arcane and specific to each TV manufacturer's design group, a fully functional implementation of this invention could be realized quickly on a PC-based platform by adding to ANY standard PC the following:

- a TV tuner card which supports closed caption decoding
- application software which performs the functions of this invention by reading the TV tuner card's CCD BUFFER; allowing the customer to move the PC's mouse to select; performing the same processing of the CCD BUFFER's data versus PC display mouse cursor location on-screen to identify the selected word; feeding that word ( after stripping away control codes, etc. ) to the PC's Internet browser.

An additional feature of this invention is it's ability to "look" for URLs ( <http://www.xxx.yyy> or [www.xxx.yyy](http://www.xxx.yyy) ) sent via the captioning service of line 21. When found in the CCD buffer, these could be AUTOMATICALLY copied and stored as a list for the customer to review and use as search terms to his/her browser at a later time.

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